

Discussion and Notes

Keep a copy of these safety training notes and a signed attendance sheet to verify regular safety training. Regulatory inspectors will usually request proof of safety training. A copy of the sign-up sheet that we suggest using may be found at www.flinnsci.com/media/412875/signup.pdf.

Please see the Chemicals section in your current Flinn Scientific Catalog/Reference Manual for general shelf-life information for every chemical that we sell. Remember that the expected shelf life of a chemical depends on proper storage and handling. The terms used to describe shelf life are defined on page 19 in the 2013 catalog.

The Flinn Purgit™ Chemical Storeroom Exhaust System (Catalog No. AP1688) is designed for school storerooms and provides four air exchanges an hour.

Reducing Chemical Waste

The requirements and costs associated with the disposal of contaminated, unused or unwanted chemicals are a serious concern for many schools. Some of the factors contributing to this problem include purchasing chemicals in large package sizes, lack of chemical inventory procedures, teacher turnover and reassignment, and changes in course offerings and laboratory curricula. Chemical disposal is a necessary part of school science laboratory management. By being proactive and following the guidelines described below, however, schools can minimize the hazards and reduce the burden of chemical waste disposal. Use this plan to reduce chemical waste at your school!

1. **Maintain an up-to-date inventory of all laboratory chemicals.** Maintaining an accurate chemical inventory is key to eliminating excess or unneeded chemicals.
2. **Purchase chemicals wisely.** Purchase only the quantities needed for the next 1–3 years. Buying chemicals in bulk to save a few dollars may end up costing you more in future disposal.
3. **Date label all chemical bottles.** Knowing the age of chemicals and their properties or shelf lives will help you evaluate if chemicals are still usable. All Flinn chemicals are shipped with a date label.
4. **Use older chemicals first, before they decompose.** This requires date labeling of chemicals and proper chemical inventory management.
5. **Provide climate control and ventilate the chemical storeroom.** Store chemicals in a cool, dry environment. Heat and humidity will quickly degrade chemicals, resulting in materials that are unsuitable for laboratory use and may require disposal. Ventilating the storeroom by providing a continuous air exchange will provide a better environment for storage of chemicals and improve their shelf life—it's also much safer!
6. **Do not accept donations of chemicals.** Donated chemicals are usually of unknown age and unknown purity—as well as a future disposal problem.
7. **Follow good laboratory practices.** Use care when removing chemicals from bottles for lab use or solution preparation. Never allow students to place chemicals back into a chemical reagent bottle. Accidental or inadvertent contamination will dramatically reduce the purity and shelf life of a chemical.
8. **Label all chemicals and prepared solutions.** Properly labeling solutions when they are prepared eliminates the hazard and cost of disposing of unknown mystery substances in the future. Most “unknown” chemicals are bottles or solutions that either were not labeled at the time of preparation or were not labeled securely, so the label has fallen or worn off.
9. **Prepare only enough solution for immediate use.** Many of the chemicals schools dispose of are prepared solutions that were never used.
10. **Never store chemicals or solutions in “homemade” bottles.** Storing solutions in containers not designed for chemical storage (e.g., old peanut butter jars or soda bottles) leads to a shorter shelf life of the laboratory chemical. “Homemade” bottles may not be compatible with the chemical and do not provide suitable protection.
11. **Store hygroscopic and deliquescent chemicals in Chem-Saf® bags.** Chemicals that absorb moisture from the air generally have poor shelf lives. Make sure bottles are tightly capped and use Parafilm M® around the cap for extra protection. Placing bottles in a plastic bag with a twist tie will help keep moisture out and increase shelf life.

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For more information on chemical management, please read the “Seven-Step Plan to Clean Up Your Storage Area” article on pp. 1154–1155 in the 2013 Flinn Scientific Catalog/Reference Manual.

12. **Perform microscale lab activities.** Most experiments and even demonstrations can easily be reduced in scale at least twenty-fold, greatly reducing the amount of chemical waste that is generated.
13. **Purchase chemical demonstration kits or student laboratory kits that contain exact quantities of chemicals.** This eliminates storage and disposal of “extra” chemicals. At the end of the lab, there are no unused or unwanted chemicals!
14. **Plan ahead and consider the eventual disposal of a chemical before purchasing.** When choosing lab activities, look at the disposal procedures for any required chemicals before deciding to include the lab. If the disposal procedure is difficult, consider microscale techniques or substituting less hazardous materials.
15. **Treat leftover chemicals or chemical by-products from a lab immediately after use.** Do not stockpile leftover solutions or by-products from an experiment. Incorporate simple neutralization, precipitation, or oxidation–reduction of chemicals directly into the lab procedure.
16. **Properly store hazardous waste for chemical disposal.** Keep different types of characteristic wastes (e.g., flammable, corrosive or toxic chemicals) separate. Properly label all waste containers with specific contents and amounts.

Free Video—Chemical Treatment and Disposal Options

Learn how source reduction, reuse and recycling, and chemical treatment options can save you time and money. View the free video that is part of the Flinn Scientific Laboratory Safety Course. <http://labsafety.flinnsci.com/Chapter.aspx?ChapterId=128&UnitId=5>

Thank You for Your Support

Please continue to support our efforts to improve safety in school science labs by ordering your science supplies and laboratory chemicals from Flinn Scientific.

Next Month’s Topic

“End-of-the-School-Year” Safety Tips

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